THE JOURNAL OF PERIODONTOLOGY

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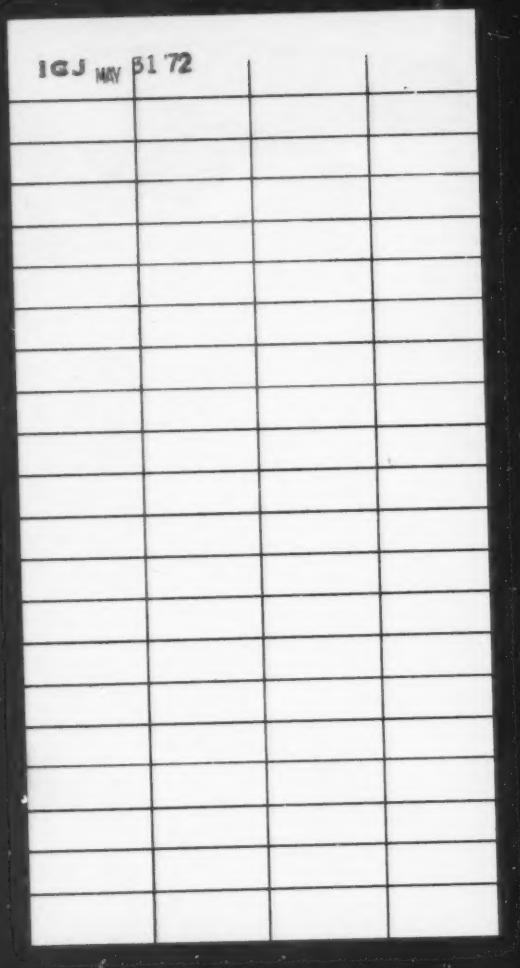
January
1944

Published by
THE AMERICAN ACADEMY OF PERIODONTOLOGY

VOLUME 15
NUMBER 1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THE JOURNAL OF PERIODONTOLOGY is lovingly dedicated to the memory of Doctor Gillette Hayden. Her selfless devotion and untiring efforts in behalf of periodontia and the American Academy of Periodontology, have served as an inspiration to her close associates which can only be consummated by carrying onward the work for which she spent her life.

THE JOURNAL OF PERIODONTOLOGY

(J. Periodont.)

Published twice yearly—January and July—by

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Publication and Editorial Office: 555 W. MAPLE AVE., BIRMINGHAM, MICHIGAN

Single copies of this number may be obtained from

Publication Office at $1.00 each

Subscription Price $2.00

All foreign subscriptions to be paid in United States money

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Publication in the JOURNAL OF PERIODONTOLOGY *is not to be understood as endorsement by the Journal or the* AMERICAN ACADEMY OF PERIODONTOLOGY *of opinions expressed in any article, abstract or extract. The object of publishing the various views is to present them without prejudice to the reader for his own evaluation.*

THE JOURNAL OF PERIODONTOLOGY is published to serve as the professional journal of periodontia; to keep dentists in touch with research being carried on in this field and related sciences; to stimulate greater interest in the supporting tissues of the teeth and their relation to oral and general health. The plan to continue the publication of abstracts indefinitely will make the Journal a fund of extensive information, readily available to students, teachers, researchers, and clinicians.

The Journal is the official organ of the American Academy of Periodontology and will contain, therefore, those papers of scientific and clinical interest which are presented at the annual meetings of that society. Abstracts of important articles on periodontia that appeared during the year of 1943 will be continued in later numbers.

We are grateful to all who have made available the subject matter from which the abstracts and copies of abstracts have been made, including the authors of the original articles, owners of the journals mentioned in the text of the abstract section, and those who have aided in any way in compiling the material comprising this issue.

DENTIST—1802

"THE word Dentist, has been so infamously abused by ignorant pretenders and is in general so indifferently understood, that I cannot forbear giving what I conceive to be its original meaning; viz. the profession of one who undertakes, and is capable of not only cleaning, extracting, replacing by transplantation and making artificial teeth; but can also from his knowledge of Dentistry, preserve those that remain in good condition, prevent in a very great degree, those that are loose, or in a decayed state, from being further injured, and can guard against the several Diseases, to which the Teeth, Gums, and Mouth are liable; a knowledge none but those regularly instructed, and who have had a long and extensive practice, can possibly attain; but which is absolutely necessary, to complete the character of a Surgeon Dentist."

Quoted by B. W. Weinberger, D.D.S. from B.T. Longbothom's Preface to his *Treatise on Dentistry*, published in Baltimore in 1802. "The Fundamental changes in dental practice from its concept in 3000 B.C." by B. W. Weinberger: *D. Items of Interest*, 65(1):12-16. Jan. 1943.

THE JOURNAL OF PERIODONTOLOGY

JANUARY, NINETEEN HUNDRED FORTY-FOUR

Moniliasis*

By ARTHUR R. WOODBURNE, *Lt. Col.*, M.C.A.U.S.
Fitzsimmons' General Hospital, Denver, Colorado

MONILIASIS comprises a group of pathologic conditions of the skin, mucous membrane, the respiratory tract and the gasto-intestinal tract associated with the presence of the *Monilia albicans*. This organism is one of the few yeast-like fungi pathogenic for man and belongs to the class – *Fungi imperfecti* to which practically all the pathogenic fungi belong. It belongs to the family of *Psuedosaccharomycetes*, and is differentiated from the ordinary yeasts by the fact that no sexual forms are known. Further classification places it in the order *Moniliales* species *monilia* or *candida*.

Before going further it might be best to say here that we will use the term *Monilia* for this species although three terms are encountered in the literature. Older American terminology used the name *Oidium albicans*, however this term is now reserved for one sub-group of the *Mycodermata*, the *Oidium lactis* being the most common example. *Candida albicans* is commonly used in the European literature, however, the recent and best American usage gives *Monilia albicans* the preference.

Yeastlike forms of microörganisms were described as early as 1833 by Kutzing (1), however, no very clear classification was made until Vuillemin, in 1901 (2), classified many of these organisms.

As late as 1922 Greenbaum and Klauder (3) and in 1928 White (4) were still confusing various organisms in this group, and by their studies cast considerable doubt on the etiologic specificity of any of these organisms. It was not until 1933 through the work of Benham (5), Hopkins (6), and Lewis (7), that these groups of yeastlike organisms were satisfactorily classified, methods of differentiation clarified, and a satisfactory separation made between pathogenic and nonpathogenic species.

For the purpose of our present discussion the yeast-like fungi will be classified as *Moniliae*, *Cryptococci*, and *Mycodermata*. Members of these three groups have been confused and by various observers have been given etiologic significance in the same conditions.

For the present then we will proceed on the hypothesis that moniliasis is a

*Lecture delivered at W. K. Kellogg Institute, Ann Arbor, Michigan, April 26, 1943, A. A. P. Post-Graduate Lecture Course. *See also p. 14.* The Bureau of Public Relations of the War Department has authorized its publication.

specific infectious disease produced by the *Monilia albicans*, and not produced by other members of the monilial group.

The *Monilia albicans* attacks several structures of the body; generally attacking skin or mucous membrane. Pulmonary moniliasis is not rare. The clinical picture suggests pulmonary tuberculosis, however, the organism does not attack the lung parenchyma, but usually only the bronchi. The organisms are easily cultivated from sputum. Certain diarrheas are manifestations of the effect of *Monilia albicans* on the gastro-intestinal tract. These organisms are easily cultivated from the stools.

A characteristic erosion of the skin of the web between third and fourth fingers of either or both hands is a fairly common disease due to this organism. This condition is seen most commonly in housewives and bartenders, and it is felt that the constant immersion of the hands in water is one of the main predisposing factors. This factor of moisture and maceration has no doubt a large bearing on other favorite locations for this infection namely, under pendulous breasts, in the axillae, groin, on the inner surfaces of the thighs, the vagina, and mouth.

Our interest in this discussion will confine us to the consideration of moniliasis as it involves the mouth and lips. Moniliasis as it attacks the lips is called perlèche and is characterized by a moist symmetrical erosion at the labial commissures. The skin is soggy bright to dusky red and the upper layers of the epidermis are lost. A deep crack sometimes develops at the bottom of the fold and occasionally a grey or white membrane may be seen over part of the area, and in some cases over the whole area. These areas show no deep infiltration which is the main clinical point differentiating perlèche from the split pea papule seen occasionally in secondary syphilis.

A lesion almost indistinguishable from perlèche, not of monilial origin, is a very similar lesion due to a dietary deficiency of riboflavin. In these lesions the organisms cannot be found, and ophthalmologic examination shows a proliferation of the small vessels at the limbal area of the eye, characteristic of riboflavin lack.

Thrush, an acute moniliasis of the mouth of infants, is characterized by white flakes of membrane covering the tongue, lips, gums, and buccal mucous membrane. On cursory examination these appear like milk curds and are often overlooked. Infection frequently takes place during passage through an infected birth canal and is transmitted in nurseries by nipples, nursing bottles, pacifiers, and other contaminated utensils. The infection reaches epidemic proportions in nurseries occasionally. This acute type of moniliasis usually responds rapidly to treatment, and proves dangerous only in debilitated or premature infants.

In adults two varieties of buccal moniliasis are seen; one a subactive type more closely resembling the above acute form, and the other a chronic form which shows little or no membrane. The subacute variety is characterized by white, cream colored or greyish elevated plaques of membrane which begin as minute dots and slowly increase in size. These patches may be seen scattered over the entire buccal mucous membrane including the hard and soft palate or may remain confined to one or several rather limited areas. Surrounding the patch of membrane there is a moderate erythema and when the membrane is removed the base is seen brightly inflamed with oozing of blood from the trauma of removing the membrane. This membrane does not wipe away but must be gently pulled away and causes some pain on removal. The membrane rapidly regenerates in areas where it has been removed.

In the very chronic form a diffuse redness and dryness of the buccal mucous membrane is seen with an occasional small fleck of membrane. The tongue is dry, fissured and cracked and presents a "raw beef" appearance. There is some edema of the entire buccal lining membrane and some swelling of the tongue. The tongue and entire mucous membrane presents often a glazed shiny appearance. The saliva is sticky and stringy and the patient complains bitterly of dryness and burning. Bland foods only can be taken, for any rough foods, fruit juices or other acid foods cause considerable pain. The mastication of meat and other foods requiring much chewing becomes a major problem, and because of these difficulties the diet usually is very inadequate which factor predisposes to an increase in the severity of the lesion of the mouth.

ETIOLOGY

Many factors enter into the etiology of this condition. It is most commonly seen as thrush in debilitated infants or in late adult life, although a few cases are seen during middle life. Vitamin deficiency lays the background for many of these cases and this is probably the chief agent in otherwise healthy vigorous adults. Riboflavin and other factors of the B complex are probably the most important vitamins in this field.

Meade (8) goes so far as to say that moniliasis never occurs in a healthy mouth. It is certain that atrophy due to disease or age is definitely a predisposing factor. Rough dentures and calculus are certainly responsible for local recurrence in some individuals. Chronic debilitating diseases such as cancer, tuberculosis, and diabetes furnish suitable soil for the onset of this condition, and it frequently makes its appearance as a complication following such acute infections as measles, scarlet fever, typhoid fever, and influenza.

Local catarrhal inflammation in the mouth, and trauma either accidental or surgical, have produced foci of lowered resistance in which moniliasis has developed. It is not uncommon to find it developing in areas of carcinoma of the mouth or in scars produced by X-Ray or radium therapy.

Monilia grow best in an acid medium so that local and dietary conditions predisposing to a highly acid saliva will favor the onset of this condition.

Monilia albicans is widely distributed in nature and most of us have frequently been exposed to infection by this organism. Skin tests with an extract of the monilia called oidomycin given to many normal individuals show that a very high percentage have become sensitized to this organism. The skin test is very similar to the usual tuberculin test; the extract is injected intracutaneously and the result is read after twenty-four to forty-eight hours by the amount of inflammation produced.

Most observers feel that this high incidence of positive reaction is due to gastro-intestinal infection which passed as a simple diarrhea. The *Monilia albicans* is a weak pathogen, and clinical manifestations develop only in those individuals in which the balance of immunity has been upset by general or local changes. This same situation is commonly seen in dermatologic practice in dealing with another more common group of fungus diseases; the dermatomycoses. Despite the fact that this organism is a weak pathogen once established it often is very persistent. Finnerud (9) has shown that passage through susceptible hosts rapidly steps up the virulence of this organism.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of *Monilia albicans* infection presents no great difficulty if its characteristics are kept in mind, however, there are several diseases of the mouth which present difficulties and these will be taken up separately.

Herpetic or aphthous lesions of the mouth when a pyogenic membrane has been formed might present some difficulty. However, this membrane is yellow to brown and is easily wiped away leaving the crater of the previous lesion. Pain is much more severe in these cases. The history of acute attacks, often recurrent, and the fact that *monilia* are not found in fresh preparation should rule out this condition.

Primary and secondary syphilis might present some difficulty. Here, however, we would have a much deeper, palpable infiltrate, ptyalism instead of a dry mouth, an associated adenopathy, secondary lesions on other skin and mucous surfaces, in all cases a positive darkfield examination for *Treponema pallida* and in most cases a positive Wasserman or Kahn test.

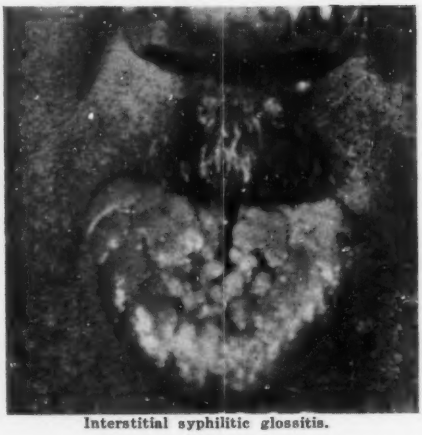
Erythema multiforme might offer difficulty in those cases in which the vesicle had ruptured and a secondary membrane formed. Here the local pain, the easily removed yellow to brown membrane, and the ptyalism would not be suggestive of moniliasis. Further examination would show the eruption of the skin particularly on the hands, wrists, feet, ankles, face, and neck with evidence of a present or subsiding acute streptococcic infection, most commonly a nasopharyngitis or tonsillitis.

Discoid lupus erythematosus commonly produces lesions of the mouth. However, these are usually erythematous, dry, show no membrane and are associated with dusky, erythematous infiltrated patches on

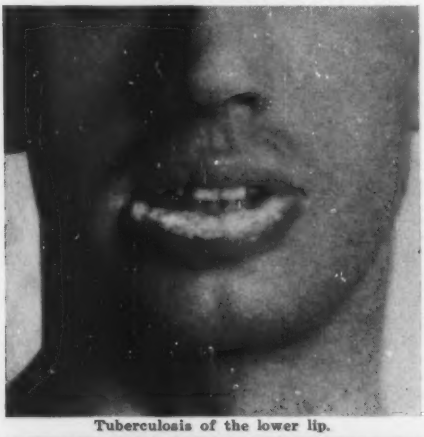
Characteristic Appearance of Subacute or Chronic Moniliasis in the Mouth

Characteristic Appearance of Subacute or Chronic Moniliasis in the Mouth

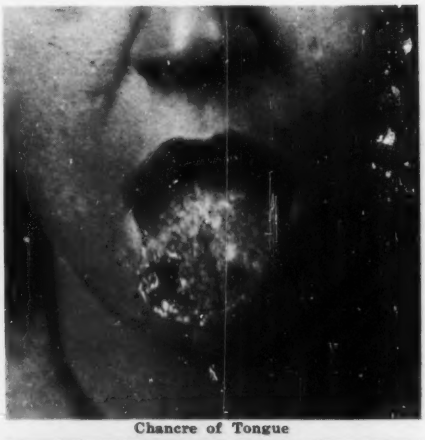
Lupus erythematosus, showing characteristic lesions of lips with butterfly configuration over nose and cheecks.



Interstitial syphilitic glossitis.

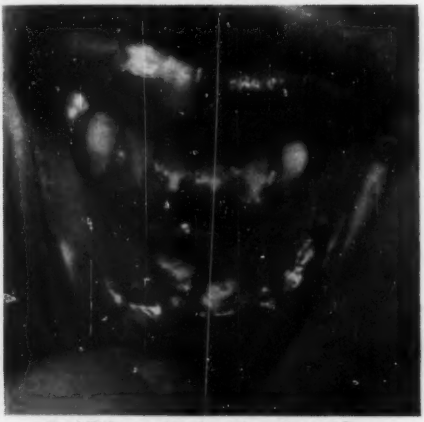


Tuberculosis of the lower lip.



Chancre of Tongue

Syphilitic papules of tongue. Note infiltrate and lack of membrane.



Syphilitic papules, buccal surface of lips.

the cheeks, nose, and scalp characterized by follicular plugging, atrophy and scarring.

Lichen planus of the buccal mucous membrane may be quite confusing at times. However, here the lesion is a bluish white papule, pin point to pin head in size with no membrane. Any effort to remove the top of this papule will show that it will not peel off without tearing. Characteristically, these papules will be fused to form arcs and festoon patterns, often cobweb like in appearance and in those areas in apposition with the molar teeth. Commonly these lesions appear to be slightly depressed below the level of the surrounding mucous membrane. There is no halo of inflammation seen here. Microscopic examination will show no monilia.

Leukoplakia is the lesion most commonly confused with moniliasis. I would estimate that at least fifty per cent of patients that I have seen for buccal moniliasis had previously had areas treated by the cautery or radium with the diagnosis of leukoplakia.

Leukoplakia presents a greyish hyperkeratosis usually in areas of irritation such as the lips from the pipe stem; the occlusal ridge from ragged teeth, or in places rubbed by a poor denture. This hyperkeratosis often looks like a monilial membrane but cannot be removed without tearing. It is usually only seen in older individuals, and shows no surrounding inflammation. Microscopic examination of fresh preparations would show no mycelia, and biopsy will show the characteristic picture of leukoplakia.

TREATMENT

The first step in the treatment of buccal moniliasis should be a thorough investigation of the patient to disclose contributing factors which should be controlled.

Thus cancer should be eliminated, diabetes or tuberculosis discovered and controlled, the diet should be investigated and if inadequate a proper diet should be insisted upon. Any lack of vitamins should be corrected by proper supplementary medication.

Locally, oral hygiene should be made adequate, calculus should be removed, dentures adjusted and an alkaline mouth wash prescribed. There are several fungicides which are effective as local applications. The acute thrush responds rapidly to a one per cent aqueous gentian violet solution. In the more chronic cases, one to five per cent gentian violet dissolved in either pure water or equal parts water and alcohol is usually helpful. Lugol's solution of iodine has been very useful in my hands. I have used it full strength to be painted on and also as a mouth wash in a dilution of ten drops to a half cup of warm water. Iodine by iontophoresis has been helpful in clearing up resistant plaques. Silver nitrate also has been very useful. For acute tender areas two to ten per cent solution is painted on twice a week. For very thick plaques up to twenty-five per cent is used once or twice a week. Potassium permanganate solution one to one thousand is often helpful as a mouthwash. Some authorities recommend hydrogen peroxide, and sodium perborate very highly, however, my experience with these preparations has not been too successful.

Thymol in doses of ten grains three times a day by mouth is recommended in controlling stubborn and extensive cases.

X-Ray therapy in small doses through the cheeks and into the mouth has improved some cases. The dose should be about 100 r at 100 K.V.P. to all involved areas. This should be repeated once a week for four treatments.

Local destructive measures such as cautery, coagulation, fulguration are mentioned only to be thoroughly condemned since prompt recurrence and frequent wide extension have followed their use in my experience.

To close the discussion on treatment, I wish to reëmphasize the necessity of scrupulous removal of all calculus and other irritating factors and adequate attention to the general health since there is frequent recurrence when these are neglected.

PROGNOSIS

The acute infection responds rapidly to treatment, and with a healthy patient, local treatment should produce a complete cure in one to two weeks.

In the subacute and chronic forms no such cheerful outlook is possible. These cases are always stubborn requiring from one to several months of vigorous treatment. Drugs and methods must be varied to meet varying conditions and even in the hands of the most resourceful practitioner results often will be discouraging.

One of the most discouraging problems is that of recurrence shortly after strict control has been dispensed with.

These patients must continue with the most scrupulous attention to mouth hygiene, and with some mild local medication for some weeks after everything appears well. With strict attention to detail and good coöperation from the patient results will eventually be satisfactory.

REFERENCES

(1) Algamin Aquae Dulcis. Germanium Decas III. 1833.

(2) *Rev. gen. sic. pures et appliq.* 12: 732, 1901.

(3) Greenbaum S.S. and Klander J. V.: "Yeast Infections of the Skin." *Arch. Dermat. and Syph.* 5:332. March, 1922.

(4) White C. J. and Swartz J. H.: "Cryptococcis Epidermica." *Arch. Dermat and Syph.* 18:692. Nov., 1928.

(5) (a) Benham R. W.: "Certain Monilia Parasitic on Man." *J. Infectious Diseases* 49:183. Sept., 1931.
(b) Benham R. W. and Hopkins Anne McH.: "Yeastlike Fungi Found on the Skin and in the Intestines of Normal Subjects." *Arch. Dermat. and Syph.* 28:532. Oct., 1932.

(6) Hopkins J. G.: "Moniliasis and Monilids." *Arch. Dermat. and Syph.* 28:599. Apr., 1932.

(7) Lewis: *Medical Mycology.*

(8) Meade: *Diseases of the Mouth.* 5th Edition, Page 609.

Moniliasis—From the Laboratory Standpoint*

By ARTHUR R. WOODBURNE, *Lt. Col.* M.C.A.U.S.

Doubt is still frequently thrown on the etiologic importance of *Monilia albicans* by the fact that organisms not differentiated from the species by some observers, are frequently encountered on normal skin and mucous membrane.

The main point of argument is whether the *Monilia albicans* is a primary etiologic agent or whether it is a secondary invader in many previously damaged areas of skin or mucous membrane.

These organisms are so constantly found in erosio interdigitalis, perlèche and buccal moniliasis that most observers feel that while there are many predisposing factors that without the *Monilia albicans* these lesions do not occur.

Because the literature covering the yeast-like fungi as causes of disease is so confused we will briefly discuss some of the laboratory and clinical points which are pertinent. For our purpose we will discuss these yeastlike organisms under three groups: first the *Moniliae*, second the *Cryptococci* and third the *Mycodermata.*

Greenbaum and Klander (1) by implanting *Cryptococci* into the abraded web between fingers have produced lesions almost indistinguishable from erosio interdigitalis. However, these lesions usually healed spontaneously and never produced the resistant plaques of the true monilial lesion.

Many other workers have reported *Monilia* from normal skin, mucous membrane, and stools. Similar organisms were found more frequently up to forty per cent in stools of patients with diarrhea. With monilial organisms found in so many normal patients doubt was cast on the pathogenic significance of this organism.

During the period, 1920 to 1930, more exact methods of mycologic investigation were developed and Benham and Hopkins (2) undertook an investigation of normal persons to prove or disprove the occurrence of the *Monilia albicans* with no evidence of pathology.

Many organisms very similar to *Monilia albicans* are also found in such an investigation, and investigators have constantly given them significance as pathogenic agents. These groups are the *Cryptococci* and *Mycodermata.* A knowledge of the important differential points between these groups as

*See footnote bottom of page 7. Publication authorized by the Bureau of Public Relations of the War Department.

well as a differentiation of the various species in these groups is necessary if a satisfactory cultural differentiation is to be made.

The literature previous to 1933 is entirely unreliable in studying this problem since it was not until that time that accurate methods were established for their differentiation and anything like standard criteria for diagnosis were established.

The yeastlike fungi are simply differentiated into the three main groups by growth characteristics. That is, *Moniliae* grow with a pasty, cream colored or grey growth producing both budding cells and mycelia in culture; the *Cryptococci* form a tan, cream, or pink mucous-like, sticky growth producing only budding cells in culture; while the *Mycodermata* produce a dry, rough or downy growth with no budding cells but septate mycelia composed of oblong cells which break up into spores.

Most observers have shown that yeastlike organisms are frequently present on normal skin and mucous membrane. However, Benham and Hopkins (2) have shown by their study that when proper mycologic methods are employed the organisms found on normal skins were practically all *Cryptococci* or *Mycodermata*. A few non pathogenic *Monilia* were encountered but *Monilia albicans* was never found. While this does not prove that *Monilia albicans* never occurs on normal skin, it certainly strongly suggests that the occurrence of this organism on normal skin is rare.

The fact that this organism occurs with great regularity in the type of lesion previously described and that it is extremely rare on normal skin makes for a strong case in support of its pathogenicity.

A complete and accurate mycological investigation requires the growth of these organisms on various media and under different conditions of temperature and oxygen tension, animal injection the study of their agglutination and precipitation reactions, and their growth on various sugar media to determine their fermentation characteristics.

Such an investigation is beyond the facilities of most of us, and for clinical purposes is not necessary.

If any of you care to go into this more thoroughly a study of some of the above references will give an understanding of the detail of complete studies.

For our purpose, I will outline a clinical-laboratory approach which will for most of us be all that can be undertaken.

The first procedure should be an examination of the membrane. As we brought out before, the membrane peels off with some difficulty, but when grasped with tweezers small pieces may be easily removed for study. Pieces of this membrane are placed on a microscopic slide in 10%-20% sodium hydroxide solution covered with a cover slip and allowed to soak for ten to thirty minutes. Direct examination under restricted illumination with the high power of the microscope will show a true *Monilia albicans* a fine branching non-segmented mycelial net with many clusters of microspores in small groups or scattered through the field. In some areas will be seen the thick walled chlamydospores at the terminal part of a mycelial branch in groups of two or three or singly and frequently detached from mycelia. This is the only organism of the fungus group which shows all the characteristic forms in the skin or mucous membrane that are seen when cultured to bring out all the diagnostic forms.

To confirm the direct examination or if there is some doubt, culture should be undertaken. Pieces of membrane should be soaked in 70% alcohol for a few minutes to inhibit the growth of ordinary cocci, then washed with sterile water, and planted in dextrose broth or on a honey agar slant. At the same time a cornmeal agar plate should be planted to grow a giant colony.

These cultures will require from 5 to 10 days to grow satisfactorily and usually do best at room temperature, however, it is best to grow one or two at the same time in the incubator. Giant colonies require several weeks to assume characteristic form.

When these colonies are examined after a week the *Mycodermata* can be excluded by their lack of budding forms. These are nonpathogenic, are common in stool examinations, and are found in cheese and milk.

The true yeasts, *Saccharomyces*, will produce ascospores while the *Cryptococci* will show budding forms, no mycelia and no ascospores.

Monilia albicans will show a cream colored, pasty growth probably with some fine

fingers extending into the surrounding media looking like fir trees. Microscopic examination will show fine branching mycelia with many clusters of microspores and chlamydospores terminating singly and in groups of two or three. Chlamydospores do not form in cultures grown at incubator (37°C) temperature.

If it is desired to work out the *Cryptococci* in a culture they may be roughly differentiated by characteristics in the giant colony into four main groups.

All groups have a mucoid typical yeasty colony.

Group 1 shows a smooth or very faintly convoluted white or cream colored colony and is nonpathogenic.

Microscopically: Buds singly and in chains with no capsule.

Group 2 is mucoid cream to tan in color and shows moderate to marked convolution of the giant colony.

Microscopically the cells are half again larger than those seen in group 1 and show a faint capsule.

Group 2 is non-pathogenic.

Group 3 shows a mucoid yellow to tan, smooth, non-convoluted giant colony.

Microscopically: These organisms are roughly 4.5 to 6 microns in size about the same as group 2 but show a wide, thick walled capsule.

This group contains both pathogenic and non-pathogenic species which may be differentiated by two methods. The pathogenic species will grow at incubator (37°C) temperature while the non-pathogens will grow well at room (20°C) temperature but will quickly die out at incubator temperature. The pathogenic species prove fatal to rats when injected intraperitoneally in three or four days. This pathogenic *Cryptococcus* produces deep infections in man and in the older literature was called *Torula histolytica*. The modern terminology classifies this organism as *Cryptococcus hominis*.

Group 4 is characterized by a bright pink color in giant colony and is non-pathogenic.

At this point in our investigation, we have excluded the *Mycrodermata* and the *Cryptococci* and now must determine whether or not our *Monilia* is *Monilia albicans* or one of the 6 to 8 other species which are non-pathogenic.

The characteristics on direct examination and in culture which were previously discussed are sufficient for diagnosis in the hands of an experienced mycologist, however, some of the other species which might be confused show characteristics as follows:

1. *Monilia stellatoidea* in giant colony shows a very rough center with a smooth border. The mycelia predominate the microscopic picture. The microspores are single and in occasional groups and are much fewer than in *Monilia albicans*. Chlamydospores are more frequent and larger than in *Monilia albicans*.

2. *Monilia candida:* The giant colony shows a yellow or green color with slight roughness at the center and mucoid periphery.

Microscopically this species is characterized by long branching mycelia with a few spores scattered along the shaft of the mycelia and chains of terminal spores but no chlamydospores.

3. *Monilia parapsilosis:* The giant colony is flat and smooth.

The mycelia are giant in size, show much branching, spores are small and dark occurring along the shaft of the mycelium or in terminal chains.

4. *Monilia krusi:* The mycelia are very large and there are many plump spores in chains—pseudomycelial forms.

Further support to these differential points is possible by fermentation cultures on various sugar medias and by agglutination and precipitation tests. However, in clinical work these methods are usually not necessary.

One of the most certain methods of showing that a certain *Monilia* is or is not *Monilia albicans* is by injecting a culture emulsion into a rabbit.

With a questionable culture an emulsion of dilution 1 to 1000 is prepared and one half cubic centimeter of this solution is injected intravenously into a rabbit. The rabbit will die in three to four days and at autopsy show typical miliary abscess of

the kidney if the organism was *Monilia albicans*. All other species are non-pathogenic for rabbits.

By bringing out the simpler and more generally available studies which may be undertaken, I have tried to show how a clinical diagnosis of moniliasis may be satisfactorily substantiated.

REFERENCES

1. Greenbaum S.S.—and Klander J.V.: "Yeast Infections of the Skin." *Arch. Dermat. and Syph.* 5:332. Mar., 1922.
2. (a) Benham R.W.: "Certain Monilias Parasitic on Man." *J. Infectious Diseases.* 49:183. Sept., 1931. (b) Benham R.W. and Hopkins Anne McH: "Yeastlike Fungi found on the Skin and in the Intestines of Normal Subjects." *Dermat. and Syph.* 28:532. Oct. 1933.

Tissue Healing Following Electrocoagulation of Gingiva*

By BALINT ORBAN, D.D.S., *Chicago, Ill.*

ELECTROCOAGULATION is a much favored method of eliminating gingival pockets. No histopathologic investigation has, as yet, been undertaken to show what happens to the tissues following the execution of this method. The present study is to fill this gap.

A case of chronic inflammation of the gingiva, with deep gingival pockets (periodontitis simplex),** was selected for the investigation (Fig. 1A). After an infiltration anesthesia the gingiva was coagulated in the lower jaw in the anterior region.*** The gingival tissues turned white and dry in appearance as a result of the coagulation (Fig. 1B). No dressing was used to cover the coagulated surface.

Sections of the coagulated gingiva were removed every two days for two weeks as biopsy specimen and microscopic slides prepared. This method permitted the study of tissue changes caused by electrocoagulation, as well as the manner by which the healing of the wound took place. Fig. 2 shows five consecutive phases in the healing process.

The gingival papilla which was resected immediately following electrocoagulation (Fig. 2A) shows blisters, necrotic tissue and bleeding. Necrosis extends deep into the connective tissue causing shrinkage and separation between epithelium and connective tissue. The keratinous layer normally covering the gingival epithelium is preserved on the surface of the underlying necrotized tissue. Due to shrinkage of the coagulated tissue the epithelial pegs are pointed.

The necrotic surface layers begin to separate from the underlying tissues twenty-four hours after coagulation (Fig. 2B). The keratinous surface is still present but is raised from its base. Large masses of bacteria have accumulated in the necrotic top layers and leukocytes dominate the specimen, entirely filling the connective tissue. There are necrotic tissue remnants surrounded by leukocytes, not only on the surface, but also within the deeper layers of the connective tissue. The necrotic layers are demarcated from the underlying tissue by action of the leukocytes and thus will be cast off from the surface. This will be accomplished within approximately three days (Fig. 2C). At this time the outer necrotic layer is missing and only some leukocytes gather on the surface. In the deeper layers thrombosed blood vessels are seen surrounded by necrotic tissue. These necrotic areas will also become eliminated by resorption or will be cast out on the surface of the wound.

In about eight to ten days after electrocoagulation the wound surface becomes consolidated. The epithelium migrates over

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**Orban, B., "Classification and Nomenclature of Periodontal Diseases," *J. Periodont.* 13(2):88-91. July, 1942.
***The electrocoagulation was performed by Dr. Theo. H. Perlman, to whom the writer is indebted.

the formerly exposed connective tissue (Fig. 2D). The connective tissue still shows signs of edema and is crowded by inflammatory cells. The epithelium is thin and on its surface shows signs of parakeratosis. This new epithelium reveals a large number of mitotic figures, indicating active growth. Some epithelial pegs penetrate deeply into the connective tissue; others are short and irregular. The connection between the new and the old epithelium is not as yet very firm as there is a V-shaped space between the two. In another specimen where the electrocoagulation extended deeper and destroyed larger surface areas, the epithelialization of the wound is somewhat delayed.

In ten to twelve days the wound surface shows signs of further consolidation (Fig. 2E). The epithelium is still thin and weak and a large number of leukocytes migrate through the epithelial cells to the surface. The sub-epithelial connective tissue is somewhat more fibrous and less cellular than previously. The inflammatory reaction is less acute and the edema is diminishing.

The outer appearance of the gingiva may indicate complete healing, but in the deeper tissues changes are still in progress which, of course, will have great importance in the final healing of the diseased gingiva.* The present study is limited to the surface healing.

Summing up the findings of wound healing following electrocoagulation, it can be stated that the healing tendency of wounds created by electrocoagulation is satisfactory. The surface was covered by epithelium within ten to twelve days and the subepithelial connective tissue has shown diminishing intensity of inflammation at this time.

It is known, however, that it is difficult to determine the proper dosage of current used and to limit its action to the desired extent. If the current penetrates too deeply into the tissues, necrosis of the alveolar bone can occur, thus causing the formation of sequestra (Fig. 3). In such cases the final healing is much delayed. Sequestra have to be eliminated from the tissue before complete healing can take place. The elimination of a sequestrum can be accomplished either through resorption of the necrotic bone by osteoclasts, or by epithelium migrating from the surface surrounding the bone to be eliminated. It might also be that leukocytes gather around such necrotic pieces

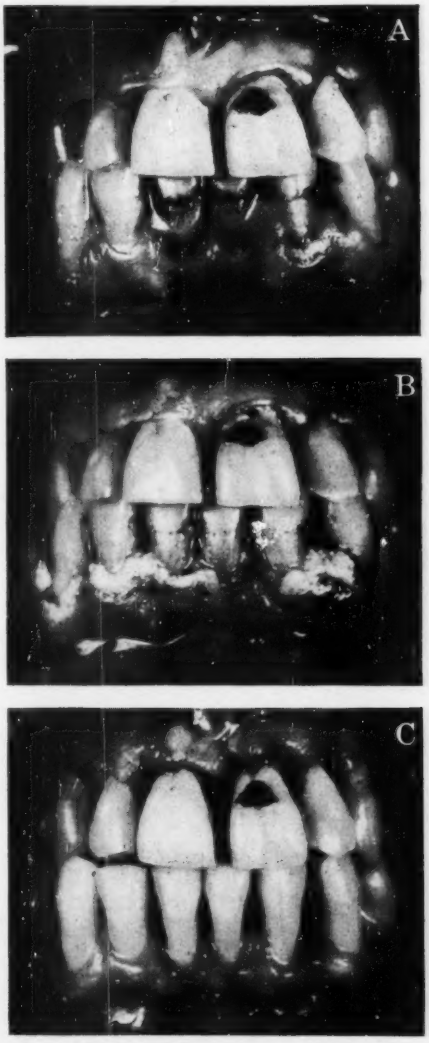


Fig. 1. A. Patient before treatment (Periodontitis Simplex)
B. Electrocoagulation in lower jaw, only.
C. Patient after completed treatment.

*Orban, B., "The Use of Paraformaldehyde and Oxygen in Periodontal Treatment," *J. Periodont.* 14:37-44. Jan., 1943.

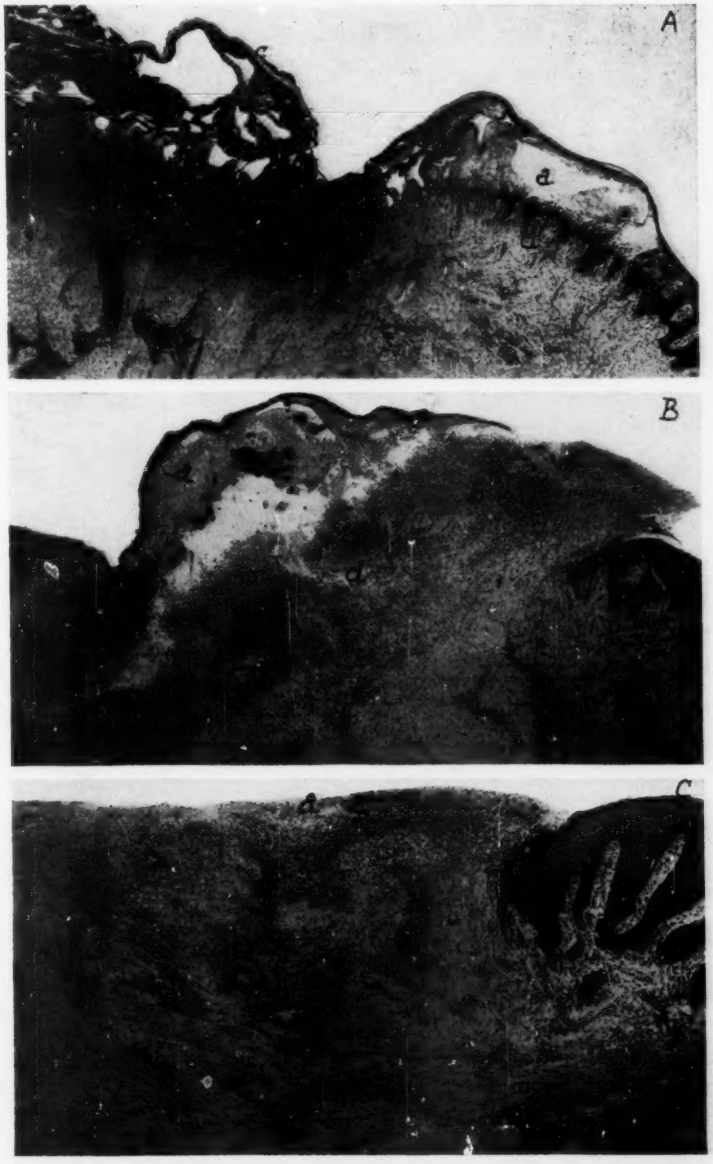
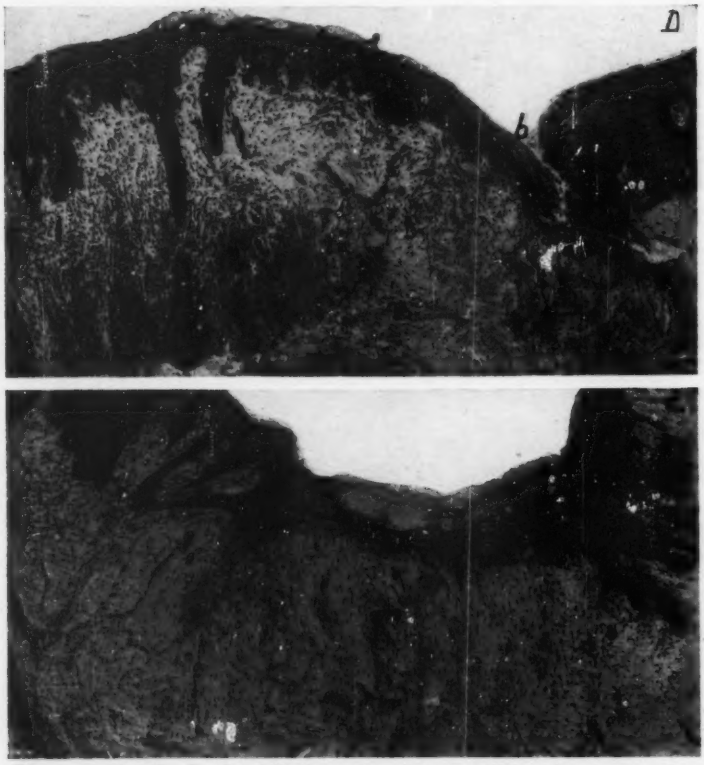


Fig. 2. Five consecutive stages in wound healing following electrocoagulation. A.—Gingiva immediately following coagulation. Large blisters (a) and necrosis of the tissues (b) are the immediate result of coagulation. Keratinous surface layer remains preserved (c). Epithelial pegs pointed (d). B.—Wound surface 24 hours after electrocoagulation. The outer layers of necrotic tissue (a) are raised from the rest of the wound by accumulation of leukocytes (b). In the necrotic tissue many bacteria grow (c). Necrotic tissue remnants (d) are surrounded by leukocytes. C.—In three days the necrotic tissue is cast off and the connective tissue exposed. Leukocytes migrate to the surface (a). Some necrotic tissue elements and thrombosed blood vessels (b) are within the tissue. **(Fig. 2 continued on following page)**



(Fig. 2—continued) D.—In eight days after electrocoagulation the wound surface is covered by epithelium (a). The epithelium is not as yet firmly connected to the old epithelium (b). The connective tissue shows edema and cellular infiltration. E.—Ten days after electrocoagulation the wound surface is well covered by epithelium (a). Leukocytes migrate through the epithelium to the surface. Due to loss of tissue the surface shows shrinkage.

Fig. 3. Electrocoagulation penetrated too deeply causing necrosis of bone, and thus sequestra are forming (b). The surface is covered by epithelium (a) but this epithelium will be broken open to permit casting out of the sequestra. Resorption (c) of the necrotic bone takes place and epithelium (d) migrates to the surface of the sequestrum. Leukocytes (e) accumulate around the necrotic pieces of bone.

of bone, forming an abscess, and thus eliminating it by spontaneous or artificial opening of the abscess. In the present case, giant cells can be seen in certain areas on the surface of the sequestra indicating progressing resorption. In one place, epithelium migrated to the surface of the bone and thus started to surround it. Inflammatory cells, also, can be observed around the necrotic bone pieces. Thus we find in one and the same specimen all methods of nature at work in eliminating sequestra. It might take several weeks before the elimination of sequestra is accomplished and final healing of the wound thus delayed.

Injury to bone should be avoided. If electrocoagulation is applied, a deep pocket should not be eliminated at one appointment. Superficial coagulation should be employed and repeated several times, to avoid bone necrosis, in preference to deep tissue coagulation.

Comments on the Dental Corps of the United States Army

MAJOR GENERAL R. H. MILLS, in one of his most recent speeches, has said: "When war was declared between the United States and Germany and Japan in December of 1941, the rapid induction of selectees created several urgent problems; the primary one being the replacement of teeth. During the first few months of this war the dental requirements for induction remained relatively high when approximately 8.8 per cent of the selectees were rejected. The qualifications for general service during this period were comparable to that of the last World War, when the inductee was required to have a minimum of three opposing serviceable natural masticating teeth, and three opposing serviceable natural incisor teeth.

"A change in mobilization requirements in March 1942, materially reduced such dental casualties to about 2.5 per cent. This requirement was further reduced in October 1942, and since then approximately .1 per cent or 1 per 1000 selectees have been rejected as a result of dental deficiencies.

"Certain changes in Army Regulations, added favorable directives, and policies issued by higher authority with a more adequate flow of supplies, have materially assisted the dental service.

"During the latter months of 1942 and early 1943, an appreciable number of Class I cases, namely personnel needing prosthetic appliances, extractions, emergency fillings, and some with oral infections, were permitted to embark for foreign theaters without having the necessary dental service completed. This resulted from the fact that there were too few dental officers, dental laboratory technicians, as well as supplies and equipment. It was not until August of 1943 that a definite directive was issued, namely, W. D. Circular No. 189, which stated that Class I dental conditions are considered disqualifying defects for any overseas area.

"Another directive was issued August 1, 1943, from the Adjutant General's Office, Preparation for Overseas Movement, which stated, 'All necessary dental treatment from a health and functional standpoint (Class I cases) will be provided troops *prior to their departure from home station.*'

"Prosthetic appliances now must also be listed on the man's service record in accordance with a change in Army Regulations as of August 1943.

"These several changes have materially assisted the Dental Corps in limiting the dental service for troops sent overseas to a minimum. It has also demonstrated without question the important place dentistry now has in the Medical Department and in Military requirements."

Major General Norman H. Kirk said in his radio speech at Cincinnati: "The profession of dentistry can justly be proud of these achievements. Since December 7, 1941, over 1,050,000 dentures have been made for the men in the armed forces. This means from a military point of view that approximately 750,000 men or 50 divisions have been made

available for overseas combat duty by the construction of dentures. These men otherwise could not have qualified. Over 25,500,000 fillings have been inserted in the mouths of soldiers, and this means additional thousands of men made available. Several million prophylactic and pyorrhea treatments have been given, and thousands of oral infections have been cleared.

"Stomatitis Vincent's or trench mouth was one of the common diseases among troops of the last World War. The incidence of this infection has been remarkably low in this war, being 4.4 per 1,000 soldiers per month in this country, and 2.8 per thousand for overseas. Better oral hygiene and an excellent nutritional program probably account for this low incidence to date.

"On the basis of this record, our soldiers receive the very best dental treatment and services the dental profession has to offer. Many of them had their first dental care in the Army. The results are translatable in terms of fighting efficiency.

"In this war the respective units of the Medical Department accompany every invasion force, not 24 or 48 hours later, but at the same time. First aid stations are ready for service when the first casualties or sick appear. Every effort is made to be as near the center of casualties as possible, and aid stations move forward as the troops advance. Medical units function throughout the battle and many hours thereafter caring for the wounded. Surgical operations are performed in tents and improvised shelter areas within a short distance from the front lines . . .

. . . "Military medicine cannot function on an hourly basis. When our troops are engaged in combat there is imperative need of a large number of physicians and dentists to take care of casualties promptly. Each combat unit must have its own doctors who have been trained with it and who go into combat with it.

"Although the civilian dentists are well qualified professionally, Army Regulations, routine, records and reports vary considerably from the average practice. Courses have been designed to help orient many officers who have had little if any military experience, and to date approximately 2,300 dental officers have graduated from the Medical Field Service School at Carlisle Barracks, Pennsylvania. Courses in oral and maxillo-facial surgery are given to many dentists at the Army Medical Center in Washington, D. C., and certain civilian institutions. Several hundred technicians have also received training in dental laboratory procedures.

"The record of the Army Dental Corps speaks for itself. There is still much to be accomplished before victory can be claimed."

American Academy of Periodontology

1944 Annual Business Meeting

Palmer House Hotel

CHICAGO, FEBRUARY 19th

Evening Sessions

DINNER—6 o'clock

Reports of committees and other business

In Our Opinion

What Place Has Surgical Procedure in Periodontia?

INITIAL STATEMENT

By HAROLD J. LEONARD, D.D.S, B.A., *New York, N. Y.*

MORE AND more periodontists are resorting to surgical resection either as a routine treatment for cases with periodontal pockets or as a method of choice in certain cases. Aside from the facts that it is an easier technic to master than the conservative, that it is much less tedious to the operator, that it may be made spectacular or impressive to the patient, and that larger fees can be obtained per hour of operator's time, what are the advantages and disadvantages of the method from the standpoint of the patient?

The prime test of treatment is whether the remaining periodontal tissues are put in a state of health which can be maintained. Secondary considerations are those of appearance, permanent retention of supporting structures, vulnerability of the teeth to caries, permanent comfort of the teeth, the ordeal of the operation itself, and the post-operative reaction.

The surgical resection as done by a skillful operator using procain local anesthesia and the surgical pack is in most cases a painless operation without much, if any, after discomfort except tenderness to biting pressure, and very little, if any, systemic reaction. When the pack is removed, the denuded root surfaces are exposed to direct vision so that calculus and débris can be removed, and the root surfaces left polished by a dental hygienist. At first the teeth are loosened by the damage to the transverse periodontal fibers but this condition soon heals and the teeth become firm as the remaining periodontal tissues regain health by being freed from adjacent congested tissue. By this method the partially devitalized tissue is completely removed and the subgingival pockets are eliminated. The remaining tissues react vigorously to the injury and to the bland medicaments in the surgical pack so that after removal of the pack, no signs remain of circulatory failure such as a bluish hue or deepened color. With good home care the teeth may be kept clean and the gingival tissues healthy even though they may grow up considerably to cover the denuded root surfaces.

In view of these acknowledged advantages why are conservative periodontists so opposed to the method as a routine? The answer is that it entails a needless loss of covering tissue and usually involves the loss of some useful supporting bone and periodontal attachment. When bone margins are exposed, there is resorption of the margin with consequent lowering of the alveolar support. By some periodontists bone and periodontal attachment are ruthlessly sacrificed in order to leave an even gingival line. The exposure of the roots is unsightly and may cause discomfort for some time due to sensitivity to cold. The denuded root surfaces are difficult for the patient to cleanse and root surface caries may occur. These disadvantages are sufficient to condemn the method as a routine if an equally healthy result can be obtained by other means without them.

The conservative method of treating the partially devitalized tissue overlying

pockets consists essentially in removing subgingival calculus and slime by means of steel instruments and in restoring vitality to the diseased tissue by means of home care massage. A pressure and release massage forces the blood out of and in the engorged capillaries, restores blood flow, brings in oxygen, and removes toxic metabolites. Provided the pressure and release reaches all parts of the congested tissue, and provided further intoxication from the surface is prevented by oral hygiene, the tissues gradually return to health without much, if any, further recession. If the treatment is completely successful, clinical reattachment obliterates the pocket. In any case the tissues become firm and tight and the pockets well lined with epithelium so as to eliminate exudate or space under the gingiva for the accumulation of further débris.

The conservative method of treatment is more time consuming and requires very high technical proficiency on the part of the operator. In rare cases the treatment is painful, even when pockets are not very deep, and may be a considerable ordeal for the patient. Occasionally the bacteremia induced by prolonged manipulation of infected tissues may cause an untoward reaction in a delicately balanced patient. In very deep pockets, especially those involving bifurcation areas, it may be impossible to detect all calculus by tactile sense alone and some will not be removed. In such a case exudate will continue to form and the tissues fail to heal. In many cases of deep congested areas between teeth, it is impossible to apply a home care massage that will reach the deepest portions of diseased tissue. In such cases the result is unsatisfactory for health does not ensue. These are the disadvantages of the conservative approach.

An occasional condition which can be successfully treated by surgical intervention and not by conservative technic alone, is the periodontal abscess near the apex, connected to be sure with the gingival sulcus but often on the opposite side of the root, and by a narrow pocket under a fairly tight gingival tissue.

The method of choice would seem to lie in complete mastery of both technics. The conservative method should be used as a routine in order to save all covering and supporting tissues possible. Where time is very limited or access to prophylactic follow-up is unavailable, or bacteremia is contraindicated or the conservative treatment promises to be too severe an ordeal, the surgical treatment may be of advantage. Certainly in those areas in which it is impossible to restore health by conservative means, and sufficient attachment remains to give promise of health if the diseased tissue is removed, it should be removed by resection. Health is paramount. We should use all means at our command to obtain it with the least possible amount of disadvantage in other respects. Our obligation is to our patient. We must weigh the advantages and disadvantages of possible lines of treatment and choose the line with most good and least ill. Competent periodontists should be proficient in both of these technics so that patients may have the benefit of both as they are indicated. It is the patient's advantage that should determine the treatment, not the financial advantage or pleasure of the operator in one operation over the other.

DISCUSSION

DICKSON G. BELL, D.D.S.,
San Francisco, California

Discussion of this highly controversial subject, the treatment of periodontal disease or curettment *versus* surgery, is always rather difficult since by this type of discussion, little consideration is given to the basic etiologic factors which contribute to the disease and would necessarily influence its treatment.

The question is asked "What are the advantages and disadvantages of the resection method from the standpoint of the patient?" In the various discussions of this question, clinicians using this method have mentioned many other advantages not in the initial statement. They are visibility, accessibility, subgingival deposits may be removed without difficulty, less painful, permits removal of all granulation tissue, complete eradication of infection, less likely to have recurrences, takes less time, and prepares the tissues so that mouth hygiene is more effective. Resection of the gingival tissues also exposes the alveolar bone for curettment or chiseling to reduce its height. It obviously follows that the advocates of gingival resection would consider the advantages of this method as the disadvantages of subgingival curettage. In a discussion such as this, it is not possible to take each one of these points and attempt to prove that these so-called disadvantages of subgingival curettage are either not such difficult problems or that many of these arguments are not based on actual facts. An answer to several of these statements was given in an article entitled "Subgingival Curettage"—J.A.D.A. 29:1438. 1942.

The disadvantages of gingival resection would likewise be considered as the advantages of subgingival curettage. In the initial statement these disadvantages have been enumerated but it might be well to discuss several of them more fully, especially the routine practice of some men—to curette the alveolar bone on the assumption that it is necrotic or diseased. Published photographs of histologic sections of a pathologic pocket have shown that the alveolar bone is not exposed. There is a layer of tissue between the bottom of the pocket and the crest of the bone. Histologists have repeatedly stated that in this disease entity the bone is not necrotic. Greig, in discussing the surgical pathology of bone states—"produce a definite hyperæmia and bone undergoes rarefaction, decalcification, osteoporosis." Necrosis of bone occurs when it is entirely deprived of its blood supply. In periodontoclasia, we have an increase in arterial blood, hyperæmia, therefore we get rarefaction and decalcification, not necrosis. Orban has stated that—"the inflammatory reaction might penetrate into the marrow spaces of bone . . . [but this] by no means indicates an infection of these areas. There is no justification whatsoever for exposing this bone and operating on it in any way." A therapeutic procedure which does not remove any of this tissue has a decided advantage over that which causes loss of support to an already weakened tooth. It has been shown clinically that it is possible in some cases for the bone to regenerate after the inflammatory condition has been eliminated. Resection of the gingival tissues will destroy the organic matrix and thereby prevent the possibility of any bone regeneration. Subgingival curettage has a definite advantage because conservation of the tissues makes it possible to obtain a greater amount of bone repair.

In describing the technic of subgingival curettage, Dr. Leonard failed to mention two very important steps: (1) the preparation of the tissues, namely the superficial layer of the epithelial lining and the surface of the cementum, as one of the requirements for healing is vital, clean, freshly exposed tissue surfaces, and (2) creation of a final blood clot, which is Nature's medium for the organization of new tissue.

There are two points on which I disagree with Dr. Leonard's statement on the disadvantages of the conservative method. If "in exceptional cases the treatment is painful and may be an ordeal for the patient," can we say this is a disadvantage of the method? Why not consider it bad judgment on the part of the operator not to use a local anæsthetic? Thus in some unusual type of pocket formation or with a hypersensitive patient, not only is it easier on the patient but the periodontist is able to do a better operation. I believe that the

chances for an "untoward reaction in a delicately balanced patient" are greater when the gingival tissues are resected or the alveolar bone curetted than when the subgingival curettage method is used.

It is opportune to comment on the present trend of thought which many periodontists are following, whereby they discard established principles of conservative surgery for gingival resection. It is the admitted practice of some to remove the detached gingival tissues in every case, including shallow pockets of 3 and 4 mm. There is also the situation in those cases with deep vertical pockets on the proximal, lingual or labial surfaces, in which the line of incision is not extended to the bottom of the pocket. I have been told that these incompletely resected areas are treated by "scaling," yet in other sections of the same mouth pockets of identical depth are completely resected.

In my opinion, the subgingival curettage method of therapy should be used whenever and wherever possible and the gingival tissues removed only when conservative measures have definitely failed or where specifically indicated.

Dr. James Nuckolls, Professor of Operative Dentistry at the University of California, recently made some rather pertinent comments on this topic and since they are applicable to this discussion, it might be well to mention them.

"It is the old story all over again and we will never get anywhere discussing my technic against yours. The question as I see it is:

"First, an understanding of the etiologic factors and a diagnosis of the disease which we are to treat.

"Second, a basic understanding of the disease process and the potential of tissue repair in that specific field.

"Third, the application of a treatment which will ensure the greatest functional repair, and this choice of treatment should, as in all cases, be the most conservative which will ensure a functional repair and only when a conservative treatment has failed should the operator resort to more heroic methods.

"If the operator is competent and knows his pathology there is no question as to the best type of treatment for there is no best type but only the procedure which will insure the maximum of function and repair and this is the issue with which we are all concerned."

M. MONTE BETTMAN, D.D.S.,
Portland, Oregon

In my opinion a competent periodontist should be able to treat periodontal pockets by either conservative or surgical procedures. The important fact to be taken into consideration is the benefit to be derived by the patient from such treatment.

While surgical procedures for the elimination of periodontal pockets require less time and I believe, less technical skill on the part of the operator, they result in the loss of more tissue than does the conservative method of treatment.

In my opinion, if the periodontist has mastered the technic of subgingival curettage, and is able to thoroughly remove all apoxemena from the root surface and the periodontal pockets, the conservative method should be the method of choice.

Radical surgical procedures should be used only after conservative methods have failed: this failure being due to faulty technic on the part of the operator or to the inability on his part to completely remove all sources of irritation.

Very satisfactory results can be secured by skillful conservative treatment without resorting to the surgical removal of the pockets in the large majority of cases.

EDGAR D. COOLIDGE, D.D.S., M.S.,
Chicago, Illinois

Dr. Leonard has outlined many advantages and disadvantages of both surgical and conservative methods of treating periodontal pockets. His concluding statement is one with which I am fully in accord, which is, "Competent periodontists should be proficient in both technics so that the patient may have the benefit of both as they are indicated."

The author does not state that surgical treatment varies according to the manner in which it is conceived and executed. It is true that dental calculus in subgingival areas can be more easily detected after exposing it to view by excising the pocket tissue, yet in my opinion the calculus should

be removed before tissue resection in most instances. Conservative methods of scaling and tissue stimulation readily eliminate a large percentage of all pockets, at least those for which dental calculus is responsible.

Dr. Leonard suggests that one of the advantages of surgical treatment is after removing the surgical pack "calculus and débris can be removed and the root surfaces left polished by a dental hygienist."

With this I disagree because as stated above I consider it best to scale the teeth before resorting to tissue resection in most cases and secondly because I do not believe that any part of the treatment of periodontal pockets should be left to a dental hygienist.

I do not see how any reasonable surgical treatment could damage the transverse fibers of the periodontal membrane. These fibers are located more apically than the alveolar crest or circular fibers. Certainly no conservative tissue resection would destroy healthy connective tissue fibers and as long as the alveolar crest group remains the transverse tissue fibers could not be destroyed. There is seldom if ever any need of cutting away any healthy tissue or any alveolar bone. After removal of the pocket tissue there should be no growing up of tissue. That would be an indication of imperfect healing.

It seems to me that Dr. Leonard, in attempting to state the disadvantages of surgical treatment and explain why conservative operators oppose this method, has stated some of the extremes as he perhaps might see them, but which do not exist for those who practice a conservative surgical treatment.

I think we all agree that it is necessary to eliminate suppurating pockets to prevent recurring suppuration. When the pocket tissue hugs the root surface so that instrumentation is very painful while scaling it is far more simple to remove the overlying pocket tissue before scaling, and the patient suffers much less during the treatment while the pocket is completely eliminated, which leaves a better condition for home care.

I am opposed to the destruction of healthy tissue in treating periodontal pockets. It is rarely necessary to cut away any of the alveolar bone. However, in such instances as it might become advisable to reduce the height of the alveolar bone crest there would not be any of the fibers of the periodontal tissue attached to it at that stage of the disease. The soft unhealthy tissue that lies in the pocket should be removed to insure prompt healing. It is contrary to my experience and study to find a reattachment of this unhealthy inflammatory tissue by any method of treatment although it becomes more condensed and firm and at times the pocket appears to be closed. I have always followed the conservative method of treatment until all shallow pockets are eliminated, but the deeper pockets that do not readily disappear I am convinced can be eliminated by a conservative tissue resection more quickly and more successfully.

ROBERT L. DEMENT
Atlanta, Georgia

The great majority of teeth are lost on account of the breaking down of their supporting structures, or the periodontium. Just as the foundation of the building is the most important part of the structure, so the periodontium is the most important structure in the masticating machine. What is the value of a beautiful piece of restorative work if the support is inadequate?

The primary object of periodontal treatment is to help in the preservation of the masticating machine by instituting procedures designed to remove pathological conditions existing in the periodontium and, as far as possible, eliminate etiological factors which might be responsible for these conditions.

There are several techniques advocated and used by various men interested in the elimination of periodontal pathology, all of which is designed to preserve, as far as possible, the efficiency of the masticating machine and protect the health of the patient.

Every student of dentistry realizes the importance of anatomical form in restoring lost tooth structure as well as the necessity of preserving normal contours of the gingival tissues. The proper anatomical form of the tooth helps to protect the supporting tissues and the normal contour of the gingival tissue not only helps in its own protection, but at the same time, lends to mouth cleanliness. When this God-made

contour is lost, not only is this tissue more liable to injury, but a certain degree of self-cleanliness is lost and it becomes more difficult for the patient to keep a clean mouth.

So, in my opinion, the procedure which removes the pathological condition and more nearly preserves the normal contour of the supporting tissue would be the procedure of choice. Of course, the etiological factors must be eliminated so these tissues may be kept in a state of health by the patient, after proper instruction and training in home care.

There are many cases of periodontoclasia treated with the more radical procedures which, in my opinion, might be treated with the more conservative technique, or subgingival curettage, but there are conditions in which the surgical removal of gingival tissue is necessary, or advisable. These cases are the ones in which the more conservative procedure, along with home care, fails to eliminate the lesion, and where, for some reason, the patient cannot carry out adequate home care or afford the operator the opportunity to follow up the case at regular intervals.

In the anterior of the mouth, for esthetic reasons, the conservative procedure should be used if possible, but in the posterior, where the multi-rooted teeth are involved to the extent that the bifurcations are invaded, or partially so, the surgical removal of the pathological tissue, in my opinion, is, as a rule, the procedure of choice. At times, I find it necessary, where conservative procedures fail, to use the gingivectomy procedure in the anteriors, always sloping the excision from lingual to labial when possible, thus leaving more favorable results from the standpoint of appearance. In cases where there is a low lip line this procedure is not too severe; but should there be a high lip line the esthetic results would not be very pleasing. In quite a few cases, in the upper anteriors, I find the modified flap operation, as originated in 1918, by Dr. Olin Kirkland of Montgomery, Alabama, very satisfactory. If this operation is carefully done, along with careful post-operative care, the esthetic results are more favorable than those from gingivectomy.

The surgical removal of gingival tissue is only used where the lesions are exceptionally deep and the chances of obliterating the lesion by more conservative procedures along with massage is very doubtful. In these lesions the transverse fibers have been destroyed and the alveolar process broken down. In the removal of the tissue the remaining process is not broken down to the extent that the support to the tooth is weakened, but only sharp areas removed to facilitate rapid and proper healing. The teeth do not become sensitive, as a rule, nor do they become loose and sore to the extent that mastication on the opposite side of the mouth is interfered with. In the healing squamous epithelium gradually reforms over the wound, a very good contour takes place and the esthetics, in eight to ten weeks, is very satisfactory.

In my opinion gingivectomy should not be performed in such a way as to sacrifice strength of adjacent teeth for esthetics, but the excision should follow on a line with the pathological tissue and leave all support possible for the teeth.

ROY O. ELAM
Nashville, Tennessee

The surgical resection and the conservative procedures which Dr. Leonard described are, of course, only a part of the whole treatment of most periodontal cases; the exception being those, the etiology of which is entirely oral uncleanliness. Failure to consider this point is an over-sight which is causing much confusion, especially in the minds of beginners in the field of periodontia. I presume, however, that this has been taken into consideration and that the question under discussion is limited to the merits and demerits of the two described techniques for the local treatment of the periodontal pocket; therefore, I shall limit my discussion to these two points.

I thoroughly agree with your statement that "The method of choice would seem to be in complete mastery of both techniques." There are periodontal pockets, as you describe, that are inaccessible except by surgical procedures. I find, however, that these cases are very few, and that a majority of pockets can be successfully treated with the conservative technique.

You state that "The prime test of treatment is whether the *remaining* periodontal

tissues are put in a state of health which can be maintained." I consider that the *amount* of tissue remaining is also of very great importance. Health can be restored and maintained with either surgical resection or conservative techniques; however, the conservative procedure offers far greater opportunities for tissue conservation, and for the generation of new tissue, and therein lies its greatest advantage.

Generation of new bone, and a clinical reunion of the soft tissue wall of the pocket to the root of the tooth are ends to be desired in every case. The degree of success in treatment is determined by the amount of tissue conserved, and by the amount of new tissue generated. Tissue is not conserved by destroying it. While it is true that new tissue may be formed after gum resection, it is also true that in most cases the results in this direction are not satisfactory, and certainly do not approach what can be accomplished by restoring health to the diseased tissue instead of cutting it away. It is my opinion that the more tissue saved, the greater are the chances for generating new tissue, and for restoring a stronger supporting structure.

Since the conservative procedure retains more tissue, and avoids the creation of larger interproximal spaces and excessive exposure of root surfaces, it would appear that it has all the advantages. The advantages seem more obvious when we consider appearance; the permanent retention of supporting structures; the lessened food retention, the vulnerability of the teeth to cervical caries, and permanent comfort of the teeth. It is my opinion that another and a considerable advantage lies in the lessened ordeal encountered by the patient during the operation, and the lessened post-operative reaction. In the rare cases which you mention, where treatment is painful, I find that tender gums and sensitive teeth are largely responsible, and that the pain can be controlled by proper medication and treatment before attempting subgingival curettage. As a rule, the predisposing factors responsible for the tender gums and sensitive teeth are the same as those responsible for the periodontal pockets. If, as is always indicated, the etiological factors are removed before attempting the treatment of the pocket, the tenderness of the gums and the sensitiveness of the teeth will be relieved, and the treatment of the pocket will be accomplished in most cases without undue pain. Scaling is too often attempted before proper attention is given to the etiological factors. It must be remembered that the periodontal lesion is a symptom of one or several local or systemic etiological factors and that these factors should always be removed before attempting local treatment of the pocket. If this procedure is followed much of the pain in the scaling process will be avoided.

In addition to removing the etiological factors, bland medicated packs are useful in relieving sensitiveness and for the control of pain. The pack also stretches the soft tissue wall of the pocket, and provides for better access. Assuming that pain from instrumentation cannot be controlled by topical medication, there is no reason why procain anesthesia cannot be used. It has its indications in the conservative procedure as well as in surgical resection. I do not find it necessary to ever put the patient through a painful ordeal with the conservative technique, and I consider the procedure less severe on the patient than the more radical operation of gum resection.

Untoward reaction can be avoided by reducing the inflammation and bacterial count of the pocket before instrumentation. This can be accomplished by the use of the bland medicated packs, and the other preoperative procedures just described. There is also opportunity of minimizing the operation by scaling but one or two pockets at a time. I see no reason for untoward reactions, certainly not to the extent of justifying the abandonment of conservative procedures.

The fact that the conservative method is more time consuming, and requires more technical proficiency than other methods is not a valid excuse for adoption of more radical procedures. Dentistry requires a high degree of digital skill in all its phases. It is no more difficult to become proficient in the intricate technique of subgingival curettage than it is to master certain other techniques required in the field of operative dentistry. I object to the claims being made by some men that many dentists are unable to develop proficiency in the delicate technique of subgingival curettage.

Such claims tend to discourage certain timid souls, many of whom could master the technique within a short time, from venturing into the field of periodontia. All dentists should be encouraged to give adequate attention to the diseases of the periodontium. This can best be done by explaining to them the simplicity of the procedure once it is understood and after they have developed the same digital dexterity with the delicate scaler as they have developed with other dental instruments. As you say, "The patient's advantage should determine the method of treatment." I would like to add, that it is the dentist's responsibility to be qualified to render the service indicated, and there is no valid excuse for him being unable to meet this responsibility where the conservative method of treating periodontoclasia is indicated.

I. HIRSCHFELD, D.D.S.,
New York City

To limit himself exclusively to either the conservative or radical method of treatment of suppurative periodontoclasia, would be impractical for the dentist, and distinctly unfair to the patient, particularly in the light of our more recent appreciation of the respective advantages each method has to offer under certain conditions.

Accordingly, the patient stands to benefit most when the dentist is open-minded in his selection of the type of periodontal treatment, according to the requirements of the individual case, or of certain teeth or groups of teeth. But it is my experience that in the vast majority of instances, conservative treatment is indicated, and I follow it routinely in my practice with but few exceptions, for reasons (enumerated elsewhere), too lengthy to explain here.

According to clinical observation, effective sub-gingival instrumentation, to be completely effective, must be done with an "all-out" thoroughness. Anything less will yield only comparative improvement which may or may not be maintained by the toothbrush, which then only acts as a crutch. Under such conditions, progress of the pyorrheal infection may be considerably slowed up but not eliminated. This constitutes a major basis for the fallacious statement unfortunately too often heard, "Pyorrhea is incurable."

On the other hand, (all other orthodox phases in treatment having been instituted), apoxesis meticulously carried out, may result in permanent periodontal health, even in instances of less than ordinary, or even no sustained, mouth hygiene. Thus in the incipient or partly advanced cases the operator who has trained himself in the effective manipulation of scalers, finds little or no occasion to resort to so-called *aids* in the treatment, nor does he have to resort to surgical (radical) treatment. A dentist so trained usually obtains successful results even in markedly advanced instances of saveable teeth. But even he will find individual teeth where only flap operations or gingivectomy will prove beneficial. In my experience, radical procedure was required only in semi-spiral pockets and those otherwise inaccessible to effective apoxesis.

In most instances of single-rooted teeth where spiral pockets terminate in a fistula on the opposite side of the tooth (such as described by Dr. Leonard in the initial statement), apoxesis done from both sides, i.e., through the pockets and through the fistula, yield surprisingly good results in from one to three treatments. Where no fistula is present, a small buttonhole incision may be similarly utilized.

Measured in terms of time consumed at the chair in operative procedure, the all over time used in the treatment of a case including the various phases common to both types of treatment, there is comparatively little time saved by the surgical method. In explanation of this statement, may I quote from my paper in the *New York Journal of Dentistry:* 12(6):237-239. June, 1942.

> In figuring up the case records of 40 patients taken at random from my files, I found that the elementary work aside from root surface curettage, took up approximately 45 per cent of the entire time, and subgingival instrumentation the remaining 55 per cent. The amount that surgical procedure would have taken would vary according to the type of operaton performed. I am convinced that some of them, including the operation, changing of dressings, etc., cumulatively take up about as much time as subgingival curettage would take. I appreciate the fact that other types require considerable less time, but I am under the impression that even these do not produce a sufficient saving to warrant their routine employment instead of conservative treatment, everything else being the same.

List of Services Common to Both Types of Treatment

1. Taking of impressions for casts and bites.
2. Charting of the mouth (making of x-rays is not included here).
3. Preliminary cleansing including removal of larger subgingival deposits.
4. Instruction and checking up on toothbrushing and other oral hygiene measures.
5. Removal of overhanging margins.
6. Reduction of food impaction.
7. Reduction of traumatic occlusion and reshaping of teeth to minimize excessive occlusal stresses.
8. Temporary ligation of teeth when indicated.
9. Coöperation in planning of restorations commensurate with specific periodontal requirements.

ARTHUR H. MERRITT, D.D.S.,
New York City

Surgical procedures have an important and necessary place in periodontia. By the use of surgery, teeth can be saved and restored to health that would otherwise be lost. It can be employed in several different ways —resection of pockets, "flap operation," access to pocket by a vertical incision, etc.

The advantages obtainable by surgery in its various applications to periodontia, are elimination of pockets, accessibility and visibility to the area to be operated upon, greater certainty in results, and conservation of time.

The disadvantages are, possible disfigurement, exposure of root surfaces, potential sensitivity to thermal changes, and added difficulty in mouth hygiene. None of these are anything more than possibilities. Where pockets are resected it should as a rule be restricted to the posterior teeth where disfigurement need not be seriously considered. Six months or a year after operation there will be very little recession. In the anterior part of the mouth resection is rarely necessary. By other surgical procedures or subgingival curettage these teeth can usually be successfully treated. In this way the objection of disfigurement can be discounted. Sensitivity to thermal changes can be reduced to a minimum by the use of silver nitrate or formaldehyde. In no case is it ever more than temporary. The increased difficulty in caring for the teeth is not great and need hardly be considered.

Everyone engaged in the practice of periodontia should be familiar with the various surgical procedures employed in his specialty and be skillful in their use. At the same time he should be as conservative as possible. It is the abuse of surgery, not its use, that is to be condemned.

JAMES A. SINCLAIR, D.D.S.,
Asheville, North Carolina

Neither the surgical nor the conservative method is the whole answer in treating periodontoclasia. As practiced today, these methods have more or less serious aspects that may be reflected in the welfare of the patient. These factors may be clinically influenced to some degree.

Our method of treatment is based on the cellular changes that take place in the involution and evolution of the untreated periodontal lesion. Space does not permit a discussion of the details involved; however, certain aspects of our treatment are pertinent to the "Initial Statement" of Dr. Leonard.

The complete mastery of both technics seems desirable, as a combined procedure is indicated in many cases. We resort to surgery in certain anatomic abnormal areas, and as a prophylactic precaution, if the gingival sulci is left too deep following our treatment. Disease often destroys the interproximal gingival tissue; a thin strip of tissue removed from the gingival edge often promotes proliferation that hastens buccolingual union of the tissue.

The surgical method requires, in our hands, less operative time, yet the healing time is longer. When the surgical pack is properly mixed and properly applied the post-operative pain is less than is experienced in the conservative method. This difference is due entirely to the pack and not to the method of operation. The surgical method without pack produces a painful slow or non-healing wound. We overcome this post-operative discomfort by using the surgical pack following our treatment. The surgical pack properly mixed and applied is indicated as a post-operative procedure in the conservative as well as in the surgical treatment. It controls pain, hastens healing and most important of all, it may lessen the incident of bacteremia.

There seems to be little difference in the end results of either treatment except in appearance and in some cases retention of supporting structures; the conservative method seems to have these advantages.

In the surgical method some of the col-

lagenous periodontal stabilizing fibers are often destroyed. Re-attachment without new formation of cementum does not occur.

In the lesions under discussion the cellular constituents of the inflammatory exudate and tissues involved are fibroblasts, the reticulo-endothelial cells, the histocytes together with lymphocytes and monocytes of the blood. Areas containing these cells, together with opsonins and other humoral defense factors of the exudate, constitute the body's greatest defense mechanism, and are involved in the repair and healing of all wounds. If this tissue is removed surgically or otherwise, the first tissue to replace it is inflammatory tissue without which no wound can heal. The inflammatory reaction is responsible for the growth of granulation tissue, the medium through which all wounds heal. In the periodontal lesion, the body has supplied inflammatory and granulation tissue in its effort to heal the injury. Healing is prevented because of the anatomical feature of the wound. Extrinsic causative factors are not *in* the tissue, but *on* the tissue. Bacterial and proteolytic toxins within the pocket cannot be destroyed by the body, because one wall of the pocket is root surface, which produces a unique lesion that is nearer an *in vitro* than an *in vivo* state. The removal of the irritants and their causative factors from the tissues, instead of removing the tissues from the irritant, seems logical. Results appear to justify this treatment.

Regarding post-operative reactions, it should be emphasized that there is no method employed in the treatment of periodontoclasia that is not without danger. Very serious results may follow the surgery as well as the conservative method of treatment, even when performed by the highly skilled operator. Any operation through an infected or contaminated field may provide a portal of entry for bacteria. When signs of a mild to severe general infection immediately follow a periodontal operation in which a general malaise, fever, chilliness and progressive weakness is present, it may be the onset of a subacute bacterial endocarditis—a condition in which diagnostic manifestations do not appear for months or perhaps years following the initial infection. Extreme caution should be observed in operating on patients with a history of rheumatic fever, as they are prone to reinfection or superimposed infection that may result in disaster. An effective preoperative therapy to clear the field of bacteria and contaminating factors is highly important in every case where surgery or conservative treatment is planned. A therapy and technic designed to control these factors is included in our treatment which, when once perfected or mastered, the indications for surgery are reduced to a minimum.

As both intrinsic and extrinsic factors are involved in the periodontal lesions, only extrinsic factors are dealt with in this short incomplete discussion.

C. B. VAUGHAN, D.D.S.,
Boston, Massachusetts

General practitioners are curious, and periodontists are interested, or should be, in the proper place of so-called surgery in periodontal treatment.

Soft tissue surgery, of the kind under discussion, is one of several methods at the disposal of the trained periodontist. The gold inlay, as a part of operative dentistry, is an essential unit in a dentist's bag of useful tricks. It is not the only unit; without it, a type of service may be offered but, with the gold inlay, in conjunction with other methods, the dentist may feel completely equipped. Thus, with gingivectomy, the periodontist is in possession of an added means of professional usefulness.

The surgical method of treating periodontal disease is not intended to replace the so-called conservative treatment. Under certain circumstances it can be a method of choice. Most operators pardonably enough prefer conservative methods. I am one of these. However, an honest statement of fact indicates that under certain conditions satisfactory results can be obtained by surgical methods and by no other.

A striking example may be offered in a case which, on examination, showed gingival tissues entirely covering the teeth. The case history revealed that dilantin sodium was being prescribed and taken, and was, obviously, the exciting cause of this unfortunate condition. Conservative efforts produced no results. However, thanks to gingivectomy, a normal condition now exists. It is futile to speculate if this

result will be permanent, should the use of the drug continue. At any rate, the gingival tissues are now healthy and have been healthy for over a year.

Another case, of routine variety, is that of a young man with marked chronic gingival infection, with pus apparent under the free gum margins of all teeth. He was a sick person; his color clearly suggested a toxic condition, and his physician was patently alarmed. Here, the conservative treatment would have effected good results, given an abundance of time, but, in this instance, there was no time. Gingivectomy restored this young man's mouth to a healthy condition, and the general improvement was startling by its immediacy and permanence. On certain occasions things must be done quickly; at such times, surgical procedures may be indicated.

Good judgment is important in dentistry, as well as in other callings, and a wise choice in the method of periodontal treatment should involve both good judgment and wide experience. What method should one use? In common with Hamlet, "That is the question." Every dentist, devoting himself to periodontia, should be as well acquainted with the one as with the other. In my own case, while I tend very strongly toward the so-called conservative methods, I regret greatly that I did not appreciate the importance of the surgical method long ago.

J. RICHARD WALSH, D.D.S.,
East Orange, New Jersey

The periodontist must be first, expert in the conservative procedure of subgingival curettage.

Without this skill he cannot do good prophylactic operations, or pocket treatment. The real art in treatment is in direct proportion to the periodontist's skill in treating the pocket conservatively.

Surgery or gum resection has its place in treatment, and it would be both narrow and unscientific to believe otherwise.

It is therefore suggested, that the dentist be not prejudiced in favor of one method of treatment, but rather a master of the situation due to his broad knowledge of diversity of methods, continually keeping in mind that the greatest healing power is that of nature, if given half a chance.

WILLA YERETSKY, D.D.S.,
Grand Rapids, Michigan

No method of treatment in any diseased condition can be considered routine. The most important factor governing treatment is diagnosis.

The diagnosis should include not only the type of disease present but a knowledge of its probable duration from the appearance of the tissue reaction, as well as depths of pockets. The patient's history of duration is not very important since he could rarely be aware of the actual onset. The operator should also observe the patient's throat and conjunctiva for significant facts which would govern the prognosis. Other pertinent medical data should be observed or obtained by history before any decision on treatment can be made.

The following type of case should always be treated conservatively—

1. Those of recent onset in young individuals.
2. Those in which there is a highly inflammatory reaction.
3. Those cases in which surgery is method of choice should have conservative treatment prior to operation.

The conservative method does not imply prolonged manipulation of infected tissues. Quite the contrary, it reduces infection very rapidly with a minimum of trauma. Therefore, any reaction in a delicately balanced patient is far less than would occur in that individual from the shock of surgery.

When a case of periodontoclasia has been of very long standing there occurs in the depths of the pockets extensive granulomatous material. This material is adherent to the soft tissue as well as to the wall of the pocket and may be very extensive. While a careful and skilled operator may be very proficient in smoothing the roots of teeth which are not visible, it is obviously very difficult, if not impossible to remove extensive granulomas through bottle neck apertures. Therefore, this type of case must be handled by surgery.

It is natural for an operator to prefer that method in which he is most proficient. Enthusiasm for a given method may tend to influence the judgment of the operator.

Hence, it is of the greatest importance that an accurate diagnosis be made and then the method of choice determined.

CONCLUDING STATEMENT

HAROLD J. LEONARD

The comments furnish it seems to me, a very good cross section of opinion in regard to this subject. Some criticism was expressed of a statement in the "Initial Statement" that conservative treatment may be painful and entail a considerable ordeal for the patient. In my own experience such treatment is seldom so painful that a patient prefers the use of a local anesthetic. The most painful part is the exploration to determine pocket depths. Once determined the scalers should be applied with such a gentle pressure against the base of the gingival sulcus or pocket that there is no real pain. Root surfaces which have been denuded of cementum and have become hypersensitive are the only real problem from a pain standpoint. Conservative treatment should avoid more shaving of the cementum than just enough to get it clean and smooth. More than this may in time expose the dentin.

The etiology of periodontoclasia and the treatment of causes such as occlusal trauma, food impaction, Vincent's infection, and systemic predisposing factors were purposely omitted so as to keep the discussion within a definite boundary.

I particularly liked Dr. Elam's comment about the skill required for the conservative technic. It does require a high degree of skill but as he says no more than is required to do good work in other technical branches of dentistry. In my experience as a teacher of periodontia, students of average technical capacity can learn to do very creditable root surface curettage or apoxesis in as little as sixty to one hundred hours of practice under a good instructor. It is a technic like violin playing that requires practice under an instructor but it is not one that is beyond the reach of any good dentist who will spend the time to acquire it. Furthermore it should be included in the technic armamentarium of every practicing dentist. Certainly there would seem to be little excuse for one who wishes to be known as a periodontist for limiting himself to surgical procedures because of lack of skill in subgingival curettage.

DENTAL PICTORIAL

This bi-monthly dental magazine for the laity was announced to the dental profession last February. It was just what many educators, public health workers, nurses, and dentists have been wishing and waiting for. Nevertheless, the number of subscriptions is not near the 100,000 minimum needed to make it self-supporting. Until it is well established, members of the American Dental Association should *prove* their interest in the dental health of the public by subscribing to *Dental Pictorial* for their own offices and also for a number of worthy patients, public health nurses, or libraries. This is an opportunity to "back the attack" against dental and periodontal disease.

Periodontists are especially conscious of the value of dental health education. Let us show our appreciation of the opportunity offered by the Public Relations Committee of the A.D.A. by sending in our quota of subscriptions to *Dental Pictorial* at an early date. Address to Bureau of Public Relations, A.D.A., 222 East Superior St., Chicago, Illinois. (12 issues, $1.00.)

Editorials

A New Language

A METROPOLITAN daily newspaper columnist has called attention recently to the need for civilians to learn to understand the soldier's viewpoint, or in common speech, the soldier's "language." Anyone who has talked with men who have returned from any of the battle fronts has been conscious of an effort on their part to tell of their experiences in *our* language as if they knew we could not understand theirs. Not that the words and phrases they use are different—that is, not so very different—it is the augmented force of ideas, experience, and understanding which are behind the soldier's language and strengthens the meaning of the words he uses. The experiences of the soldier have given him a comprehension of things as they are, and a viewpoint which only similar experiences could give to anyone else. Therein lies the difficulty.

When one studies a foreign language, it is necessary to learn its vocabulary, and grammatical construction, idioms, and the shaded meanings of words that the people whose language it is have given them. To have a clear understanding of the language it is generally considered necessary to live in the country where it is spoken, better still, in private homes, so as to understand the inhabitants' point of view. Because we cannot live at the battle front or in the fox holes with the soldiers we can never make their language our own, but we can improve our understanding of it through continued willing sacrifices and other personal contributions to shorten the war, and above all by keeping a watchful eye on the home front.

In recent years, the Dental Corps of the Armed Services has been increased by many thousands of dentists. Many of these have had additional educational advantages since enlisting. All have had disciplinary and physical training. Most of them have sacrificed the comforts of home, family, and companionship of friends. Their understanding of dentistry as a health service is beginning to expand, as they strive to meet the needs of the men going overseas.

As thousands of dentists move to the war areas, the awareness of immediate danger, hatred of the evil things the enemy represents, loneliness, the discomfort, the inconveniences, the constant contact with the results of bombing and battle and with the men who do the fighting, the continual urge to serve them, all this inevitably results in a new viewpoint—*a new language* for dentists in the armed services.

While this goes on the civilian dentist is probably working harder than ever before in his life, with mostly inexperienced assistants, with increasing demand for his services, and the many inconveniences of living in wartime. Everything is difficult, many things are annoying, worries are endlessly multiplied, and everyone is on edge. For this reason he does resent being told that he does not know there is a war on. The words he uses have an added meaning, also.

To the dentists in the armed services, the comments just made may seem

petty compared to what war is really like, over there. The two situations are not even remotely comparable.

In the meantime the civilian dentists must make an effort to improve their education and to broaden their understanding of the problems here at home. They must protect their liberties intact until the American dentists come home from the war fronts with their broader viewpoint and their new language. These will deserve careful consideration.

Health Service

THE accomplishments of the Dental Corps of the United States Army reported thus far are remarkable, and measured in terms of service to country, invaluable.

While the more tangible results of the services rendered such as fillings and dentures are impressive and of immeasureable value, the physiological benefits resulting from the elimination of infection from the mouth and from other services given are also incalculable. Where infection has been removed there would follow lessened fatigue, increased resistance to disease, local and general, and improved recuperative ability. Maxillae-facial wounds should heal more readily with fewer complications in the absence of infection in the mouth. The restoration of masticating efficiency ought to encourage better digestion of food.

The comfort that no doubt many men experienced when aching teeth were relieved must certainly have improved their morale. Also, the educational value of this health service performed by dentists should not be underestimated.

One officer in the Dental Corps writes that they look at a broken down lonely molar as an *anchor* for a maxilla-facial fracture. If the tooth is not diseased apically or periodontally it is saved when practical. He states also that where he is stationed every deep-seated cavity must have a cement base. Think of the pulps saved by such technical procedure!

One other thought in connection with this health service by the Dental Corps is that the astonishing results obtained by the Medical Corps in handling battle casualties may have been aided by the elimination of much mouth infection.

When the complete report of dentistry's contribution to the prosecution of the war has been written it will be an inspiration to those who follow this generation of dentists.

—G. R. S.

BOOK REVIEWS

Periodontia—A study of the Histology, Physiology, and Pathology of the Periodontium and the Treatment of its Diseases. By Henry M. Goldman, D.M.D., Instructor in Oral Pathology, Harvard School of Dental Medicine, Harvard University. 407 pages with 310 illustrations, including 18 in color. C. V. Mosby Company, St. Louis, 1942.

Periodontia is Dr. Goldman's first book, we believe, but his work has become more or less familiar in recent years through his writings in the *Journal of the American Dental Association, the Journal of Dental Research,* and the *American Journal of Orthodontia and Oral Surgery.*

His connection with the Harvard School of Dental Medicine, where he is associated with Dr. Kurt Thoma in the Department of Oral Pathology, has given him exceptional opportunity for observing clinical cases and for obtaining biopsy and other material for laboratory research. In addition he has thoroughly familiarized himself with the best and latest work of other authorities in the same field, and he quotes freely from their writings.

The illustrations are excellent, many of them in color, and they add immeasurably to the value of the book.

The text is divided into five Chapters as follows: I. Examination. II. Diagnosis. III. Etiology. IV. Periodontal Histology, Physiology, and Pathology. V. Treatment.

The procedure for examination is detailed and comprehensive and includes charting of the mouth and a general physical history. Methods are described for making the various medical laboratory tests which constitute part of a general physical examination but the desirability of including these technics in a book of the scope of the present volume is questionable.

Under "Diagnosis" the author classifies periodontal diseases as follows: (1) Gingival abrasion (2) Senile and pre-senile atrophy (3) Atrophy from disuse (4) Atrophy from occlusal trauma (5) Gingivitis (6) Marginal periodontitis (7) Periodontosis (8) Syndrome (combination of 6 and 7). Each of the above conditions is discussed separately, gingivitis with great detail and in all its phases; and in addition, brief descriptions of the more unusual oral diseases.

Goldman has included the basic subjects of Histology and Physiology in Chapter IV along with Pathology. This section of the book is an excellent monograph in itself. The physiology of occlusion and mastication is admirably handled. The importance of the cementum in the periodontal picture is emphasized, a minute description of its physiology and its reactions under various conditions being given. Cemental tears are most interestingly discussed. Goldman finds them in many cases where the teeth have been subject to sharp blows, and not infrequently in autopsy material along with evidences of occlusal trauma.

The author makes a nice distinction between the normal gingival sulcus and the pathological pocket. "Histologically," he says, "one can differentiate between a 'normal crevice' and a periodontal pocket by the condition of the epithelial lining. The depth of the pocket is not the distinguishing characteristic." "Crevices" of several millimeters in depth are seen in mouths which must be considered healthy, being free from pathological symptoms clinically, and histologically exhibiting a well hornified epithelial lining.

"Periodontosis" (so-called) is dealt with at length and a wealth of interesting material is presented. The author wisely quotes Orban and Weinmann on the "development of diffuse atrophy or periodontosis" (pp. 292-93), the findings of Thoma and Goldman being similar to these authorities. He presents several case reports with clinical data, photographs, radiographs, and photomicrographs of biopsy material, and a correlation of these findings confirms results of other studies that in these most refractory cases the alveolar bone and the periodontal membrane are primarily affected, any gingi-

val and inflammatory symptoms being secondary. The difficulty of making a correct differential diagnosis in these complicated cases in which the pathology is essentially in the deeper structures accounts for many failures in treatment of *supposed* marginal periodontitis.

The prognosis in periodontosis is extremely bad.

Since the causes of this type of periodontal disease are unknown, only the symptoms present can be treated. . . . . In this way the progress of the disease is cut down and in a few instances the condition disappears. This may be explained by the fact that the responsible etiology has corrected itself.

In the last chapter various types and methods of treatment are described. The author states that it is necessary to correlate the diagnosis, pathology and etiologic factors with the method of treatment instituted.

The author has not sufficiently emphasized the importance of oral hygiene and regular prophylactic care of the mouth. And this reviewer cannot refrain from criticism of the arrangement of the book.

A revision could greatly improve the assembling of the excellent material which it contains and avoid much repetition as well as make it less confusing to the reader who must shift his attention from one chapter to another in order to get the full story of any particular condition. In spite of these minor defects, Goldman has given us a very worthwhile book and he is to be congratulated on his achievement.

—CELIA RICH

A Manual for the Differential Diagnosis of Oral Lesions. By Joseph L. Bernier, D.D.S., M.S., Major, Dental Corps, U. S. Army, Washington, D. C., 228 pages, with 175 illustrations. St. Louis, C. V. Mosby Co., 1942.

Major Bernier has successfully attempted a correlation of the clinical and pathologic aspects of the various lesions of the oral tissues. The early chapters deal with indications and technic for biopsy, histology of the skin and mucous membrane, and inflammation. Then follow detailed clinical and histologic discussions of superficial lesions of the oral mucous membrane and adjacent skin, benign and malignant tumors of the mouth and jaws, tumors of odontogenic origin, cysts and miscellaneous diseases of the oral region. The author has drawn on the rich material of the Army Medical Museum and illustrates the text with numerous excellent photo-micrographs as well as photographs and X-ray studies of actual cases. No mention is made of an important group of metastatic tumors of the jaws having their primary seat elsewhere in the body. Aside from this omission, the book is an excellent presentation of the subject and should be valuable not only to specialists in the oral field but to dermatologists and medical men in general, who frequently have difficulty in finding under one cover accurate information on lesions of the mouth and jaws.

Reprinted from J. A. M. A. 120(17): Dec. 26, 1942.

Index to Dental Literature 1939-1941 —Chicago: American Dental Association, 1943. Price $7.50.

The Index to Dental Literature covering the years 1939-1941, the sixteenth volume to be published, marks the beginning of the indexing of another century of dental literature. The indexes for the years 1839-1938 inclusive were classified according to a decimal system. . . .

Starting with 1938, an alphabetical subject classification was added to the monthly index cards. This alphabetical arrangement was so much preferred to the decimal classification that, beginning with 1939, the alphabetical or dictionary method of indexing was adopted altogether . . .

In this new volume, each article is listed under the name of the author. Each article is also indexed, according to the content, under one or more subject headings. Under the subject headings, the authors' names are so arranged as to be readily found, and compilation of articles on a particular subject by one special author is easy.

In selecting subject headings, consideration was given to terms in current usage, and an endeavor was made to index articles under the headings which readily come to mind. Cross references have been employed to facilitate finding the heading used where there are a number of headings which might be equally suitable for the same subject matter.

This index also includes a list of the books published during the three years 1939-1941.—*Copy from* J.A.D.A. 30:1441, *Sept.* 1, 1943.

(e) Symptomatology and Diagnosis

(Continued from 13(2):108. July, 1942)

363—Bourne, Geoffrey H.: **Vitamin C and repair of injured tissues.** *The Lancet.* **2**:661-664. Dec. 5, 1943. Condensed in *Dentistry.* **3(10)**:595-96. June, 1943.

There is considerable evidence that adequate vitamin C is essential for the repair of both hard and soft tissue. A uniform change in scurvy is atrophy of the connective tissue fibres.

Phagocytosis is inhibited in healing wounds in vitamin C deficiency, and the growth and migration of fibroblasts is affected.

There appears to be a connection between vitamin C and calcification of bone.

It is suggested that the administration of vitamin C should become routine practice in the treatment of any injury.

—*G. R. S.*

364—Govier, Wm. M. and Margaret E. Greig.: *Science.* **98(2540)**:216-17. Sept. 3, 1943.

Incidental to a study of shock induced by hemorrhage, the authors gave dogs a diet deficient in Vitamin B-1, other elements of the B complex being supplied. The serious oral lesions which supervened were attributed to the lack of the B-1 factor but when this was later supplied, the lesions still persisted until ascorbutic acid was added in considerable quantity. Then lesions healed and no new ones appeared.

Ordinarily the dog synthesizes its own Vitamin C. This experience with dogs confirms the findings of Sure *et al* in 1939, in their work on rats, that various members of the B complex including thiamin are necessary for synthesizing Vitamin C in certain animals.

—*Celia Rich*

365—Grott, J. W.: **Parodontitis in early diagnosis of diabetes.** Schweizerische medizinische Wochenschrift, Basel. **72**:1249. *Abstr. J.A.M.A.* **122(15)**:-1048. Aug. 7, 1943.

Grott surveyed 350 patients with diabetes for the presence of parodontitis. Particular attention was paid to looseness of teeth and to the length of time these symptoms existed before the discovery of the diabetes. It was found that 148 of the patients had loose teeth: 34 others had symptoms of parodontitis without looseness of teeth. Of a total of 350 patients, 182 (52 per cent) had had changes in the parodontium before diabetes was recognized. In 80 of the 148 patients the symptoms of parodontitis antedated the discovery of diabetes by from one to five years and in 68 by five years. These figures indicate that symptoms of parodontitis can be of value in the early diagnosis of diabetes. If no sugar is detected in the urine in the presence of a parodontitis a tolerance test should be made and the blood sugar curve investigated.

—*Copy*

366—Lapira, E.: **Ulcerative stomatitis associated with an avitaminosis in Malta.** *Brit. D.S.* **74**:257. May, 1943.

A definite outbreak of ulcerative stomatitis followed a period of vitamin deficiency. The condition was almost entirely confined to children between the ages of 15 months and 15 years living in poor surroundings. Avitaminosis C as a predisposing factor was held responsible. Immediate and lasting improvement occurred on administration of ascorbic acid or limited quantities of orange and lemon juice.

—*Charles F. Vallotton*

Copy from J.A.D.A. 30(17):1478. Sept. 1943.

367—*Query:* **Dental infections and urinary infections.** *J.A.M.A.* **122(9)**:642. June 26, 1943.

Are infections about the teeth considered one of the sources of infected (surgical) kidney? I am informed that this opinion is now obsolete and untrue.

Answer: Infections about the teeth are definitely considered the source for infected kidneys of any type. There is nothing especially characteristic about this type of infection that would make it surgical but any kidney infection, under proper conditions, may become subject to surgery.

It is a general procedure in the urologic clinics of the country to search for distant foci and eradicate them in the presence of upper urinary tract infections of any sort.

—*Copy*

368—*Query:* **Obscure recurrent lesions of mouth.** *J.A.M.A.* **123(4)**:251. Sept. 25, 1943.

Extreme case of periodic ulcerative stomatitis of long duration is described with great detail. There was little gingival involvment, in fact in only one location, where a molar was missing. Otherwise alveolar bone and gingiva normal. Cultures showed thrush and other organisms and a slight indication of Vincent's. Most significant finding from general physical examination was "some hypermotility" of the descending colon and a long standing marked degree of constipation. No seasonal correlation was found but there was some correlation with conditions of mental stress. Treatments tried include hydrochloric acid, neoarsphenamine intravenously, various oxidizing agents, niacin and thiamine, and repeated doses of sulfathiazole.

Editor suggests a possible neurogenic etiology with secondary and atypical infection supervening. Treatment suggested includes (1) use of sedatives to relieve intestinal tension and also a drug to act as an autonomic nerve depressant. A bland diet. (2) Vaccine from the stools for desensitization. (3) Succinyl-sulfathiazole in an attempt to change intestinal flora. Dosage of latter is given.

—*C. R.*